

REMARKS

In response to the Office Action dated 4/10/01, amendments, without new matter, have been made to the specification. In view of the number of specification amendments, a Substitute Specification is submitted herewith. In addition to the Substitute Specification, a complete clean copy of the claims, as amended and as supplemented with new claims, appears just above these remarks.

Claims 16 and 19 have been cancelled. New claims 20-32 are submitted and their entry into the case is requested.

The Draftsperson's review of the drawings is noted. Formal drawings that address the objections to the drawings will be submitted following the indication of allowable subject matter. The examiner's objections to the drawings are noted and corrected figures of the drawings are submitted with this response with the proposed corrections shown in red. Upon an indication of the examiner's approval of these corrections as being responsive to the requirements in the Office Action, they will be incorporated into the formal drawings. In addition to correcting the deficiencies in the drawings that were noted by the examiner, some additional corrections have been made and Figures 3a and 3b have been consolidated into one Figure 3. A proposed new Figure 3 is submitted with

the other proposed drawing corrections. The new Figure 3 includes no new matter. Approval of Figure 3 is requested.

Figure 11 has been deleted, as unnecessary. Figure 12 is renumbered as Figure 11.

RESPONSE TO THE REJECTIONS

Claims 1-15 have been rejected under §112. The recitation of a "first" plenum has been replaced with "high pressure" plenum. Corresponding amendments have been made to the dependent claims. The rejection based on the recitation of "the conduit" in line 19 of claim 1 is traversed. The "conduit" is referred to in the preamble to the claim and constitutes the environment in which the inventive probe is employed. The recitation in line 19 of "the conduit" is merely a reference to that environment. The preamble is sufficient antecedent basis, since the conduit is not being claimed as a structural element of the combination. New claims 20-32 are believed to be in such form as to avoid any §112 rejections.

Claims 1-17 have been rejected under §103(a) as being unpatentable over Mahoney et al. (5,969,266) in view of Evers (4,703,661). Claim 16 has been cancelled. Reconsideration of claims 1-15 and 17 is requested. With respect to claims 1-15 and 17, it is acknowledged that Mahoney discloses plenums 40 and 42 for communicating the high and low

fluid pressures to a pressure sensor exterior of the fluid carrying conduit. Mahoney also illustrates apertures for communicating (sensing) the impact pressure of the flowing fluid to the high pressure plenum 40. All of these are features antedate Mahoney in the pitot tube art.

Mahoney, however, does not show, teach or suggest a flat or substantially flat impact surface in the sense that the impact surface is normal to the direction of fluid flow. The angular upstream facing sides of the Mahoney pitot tube (See Figure 2 of Mahoney) may be flat, but they are not the impact surfaces having impact apertures, as called for in claim 1. There are no apertures in the flat angular sides of the Mahoney pitot tube, and therefore these sides cannot be equated to the flat *impact* surface defined by claim 1. Figure 2 of Mahoney clearly shows the impact surface that contains the impact apertures to be convex, not flat. The patent to Evers adds nothing to the disclosure of Mahoney. Evers shows a non-impact aperture 16 and a low fluid pressure conduit 15, very similar to the construction of the flow sensor shown in U.S. patent No. 4,559,836, a patent referred to in the Mahoney specification. Low fluid pressure non-impact surfaces and apertures have been in the art for many years.

The novelty of claims 1-15 and of the new claims 20-32 is the combination of prior art technology with a flat impact surface on the bluff body. Such a surface develops a relatively stagnate quiescent fluid area in

front, or upstream, of the flat surface, creating the improved signal to noise ratio of the claimed probe. Heretofore, one of the major thrusts of pitot tube design was to streamline the shape of the tube so as to reduce the pressure drop and resistance to fluid flow in the conduit in which the flow rate measurement was being made. To the contrary, the flat surface of the probe's bluff body defined by the claims in this case sacrifices the pressure drop within the fluid path for the unobvious and unexpected result of higher measurement accuracy and reduced measurement noise. Nothing in the prior art, especially in the Mahoney et al. and Evers patents, come close to teaching or suggesting this revolutionary concept, as now defined in the claims present in this case.

With respect to claim 3, the longitudinal rib of Mahoney that separates the high and low pressure plenums does not respond to the specific limitation of claim 3, that states that the rib is "configured to extend downstream." Quite the opposite, Mahoney's rib extends in a direction that is lateral, or crosswise, of the fluid flow.

The examiner's rejection does not address the limitations of specific dependent claims and it is therefore difficult to respond to the prior art rejection of claims 1-15 in any manner other than what has already been presented. In summary, Evers does not disclose anything that is not already present in Mahoney et al. Mahoney et al. does not suggest a

structure the same as or even similar to the flat faced impact surface having in that surface apertures to communicate the impact, or total fluid pressure, to the high pressure plenum. In addition to this very basic distinction, Mahoney's device does not at all respond to the specific limitations of the dependent claims 2-15.

Claims 18 and 19 stand rejected as unpatentable over Mahoney et al. in view of Frick. Claim 19 has been cancelled. Reconsideration of claim 18 is requested. While Frick may generally show a process control system, the Frick patent more specifically discloses an absolute pressure sensor that includes a deformable cavity that provides a pressure related signal. This teaching has nothing to do with the specific limitations of claim 18. There is no structure in Frick that responds to the limitations of claim 18 relative to a "loop communicator", measurement circuitry providing a sensor output related to "differential pressure." The Frick system does not even relate to a differential pressure measurement and therefore there would be no suggestion of employing the absolute pressure sensor for a pressure transmitter in connection with Mahoney's differential pressure measuring pitot tube. Combining Frick with Mahoney to reject claim 18 is a combination of references that is not condoned by the court decisions that require a suggestion of the combination. The mere fact that the two

patents are in the same field of endeavor does not substitute for the failure of either patent to suggest a viable combination with the other.

The new claims 20-32 have been reviewed in light of the cited references. They are deemed allowable for the same reasons as argued above for claims 1-15, 17 and 18. Favorable consideration of the new claims is respectfully requested.

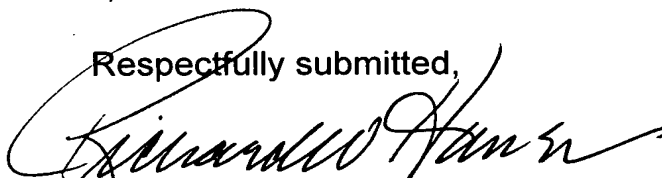
Pursuant to 37 C.F.R. §1.125(b)(2) a marked up version of the Substitute Specification is attached hereto.

Pursuant to 37 C.F.R. §1.121(c)(3), a marked up version of the claims being amended by this response is attached hereto.

An early action to allow claims 1-15, 17, 18 and 20-32 is requested.

Dated this 1st day of June, 2001.

Respectfully submitted,



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